ORIGINAL RESEARCH PAPER

General Medicine

HOSPITAL ACQUIRED INFECTIONS IN A MEDICAL INTENSIVE CARE UNIT- A RETROSPECTIVE STUDY

KEY WORDS:

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INTRODUCTION:

Infections in critical care unit are high, and of serious hospital problems. Infections acquired during the hospital stay are generally called nosocomial infections, initially known as infections arising after 48 h of hospital admission.[1,2] National Nosocomial Infections Surveillance system defines a nosocomial infection as a localized or systemic condition that results from adverse reaction to the presence of an infectious agent (s) or its toxin (s) that was not present or incubating at the time of admission to the hospital.[1]

In addition, they impose heavy cost on hospitals causing increased hospitalization time, increased morbidity, and mortality.[3] The risk factors for nosocomial infections include: Diabetes mellitus, intubation, persistent sounding, surgical drains, poor health status, lack of using gloves, irregular and inappropriate debridement and wound bandage. Although the Intensive Care Units (ICUs) account for fewer than 10% of total beds in most hospitals, more than 20% of all nosocomial infections are acquired in ICUs.[4]. According to published literature the most prevalent nosocomial infections among patients in ICU are urinary tract infection (UTI), pneumonia, bloodstream infections, skin and soft tissue infections, gastroenteritis, hepatitis and central nervous system infections like meningitis.[5,6,7,8]

Hospital acquired infections involves yearly about 2 millions in US and accounts approximately for a cost of 4.5 billion dollars.[3] The magnitude of this problems in a developing country like India is even more serious since there is no available established statistics.

AIMS AND OBJECTIVE

1. To find out the incidence of nosocomial infections in patients admitted to intensive care unit.

Methodology

The study was a retrospective analytical study. Methodology involved collection of data of nosocomial infections from patient records, analysis of infections, and their causes. A total of 100 records of patients admitted to ICU of a tertiary health center, Meenakshi medical college hospitals and research institute, Kanchipuram, Tamilnadu during October 2019 to March 2020 were considered. Detailed history and physical examination notes were reviewed in all patients' records. A diagnostic criteria for nosocomial infection by Mukherjee et al.[9] [Table 1] was used for categorizing the cases. Descriptive statistics was used for analysis. Prior permission was obtained from district surgeon and ethical clearance was obtained from Ethical Clearance Committee of Meenakshi medical college hospitals and research institute

Table 1 Diagnostic criteria for nosocomial infections.

Nosocomial Infections	Clinical Features	Labaratory features
UTI	Fever Lower abdominal pain, change in urine characteristics	Leukocytosis Positive urine culture 5
Blood Infections	Unexplained fever with chills and rigor pain, tenderness or purulent drainage at the site of insertion of IV access or CVP catheter	Leukocytosis Positive blood culture Positive CVP catheter culture(after catheter removal)

Results

This study was conducted on 50 patients in hospital Medical Intensive Care Unit (MICU) admitted during the study period of 6 months. All the patients admitted during this period with intravascular access through CVP catheter/dialysis catheter, Foleys catheter were included in the study. Eight out of 50(8/50-16%) admitted to the MICU suffered from nosocomial infection, there were 3 male and 5 female. The age ranged from 42 to 71 years, mean age being 56 years. The mean duration of stay of the patient in the hospital was 8 days. Table 2 shows the distribution of the nosocomial infections in those patients.

Table 2 Distribution of nosocomial infections among nosocomial positive patients

Nosocomial infections	Number of patients	Percentage
Urinary tract infections	3	6
Blood stream infections	5	10
Total	8/50	16

In our study, it was observed that distribution of nosocomial infections in MICU were UTI (6% - 3/50), blood stream infections (10% - 5/50)

Discussion

The incidence of Nosocomial infections in our study was 17.69% similar to hospital record statement of NM hospital and heart center and their own study, mentioned in Pratham et al.[5] Vincent et al.,[10] but less compared to 33.5% by Beaujean et al.[11] This may be due to the relative small sample size of the present study. The general distribution pattern of the nosocomial infections in our study showed bloodstream infections to be the most common, followed by UTI.

Female patients were predominant in the present study with overall mean age being 56 years. The increase incidence in geriatric age group may be due to their defective host defense mechanism. Similarly with respect to the role played by invasive devices in contributing to nosocomial infections, present study showed that 62.5% of UTI occurred in catheterized patients and 100% of bloodstream infections with catheters could be attributed to the use of invasive devices. The findings were similar to Richards et al.,[2] Pratham et al.,[5] Suman.[12]

Intensive care unit acquired infections account for substantial morbidity, mortality, and expensive. Nosocomial infections increase the cost of healthcare in the countries least able to afford them through increased: Length of hospitalization; treatment with expensive medications (e.g. antibiotics); and use of other services (e.g. laboratory tests, X-rays and transfusions).[13]

Major infections found in ICU were due to Acinetobacter baumannii, Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa, Staphylococcus aureus and Streptococcus pyogenes.[14] The infection rate was maximum in the urinary tract (44.4%) followed by wound infections (29.4%), pneumonia (10.7%) and bronchitis (7.4%). A. baumannii was found to be associated with UTIs, respiratory tract infections, septicemia, bacteremia, meningitis and wound infections. A. Baumannii displayed higher resistance to more number of antibiotics than other nosocomial pathogens from ICU. Hence, it is very important to target the nosocomial infections.[14]

Main problems in developing countries are understaffing, poor infrastructure in ICU and poor maintenance of records making situation difficult to get clarity on the incidence of these infections. Although it is difficult to solve some problems associated with financial hardship in developing countries, most solutions are simple and not resource demanding. Infection control strategies such as hand hygiene and wearing gloves; paying attention to well established processes for decontamination and cleaning of soiled instruments and other items, followed by either sterilization or high-level disinfection; and improving safety in operating rooms and other high-risk areas where the most serious and frequent injuries and exposures to infectious agents can resolve the problem to a major extent.

Limitation

Even though the sample size was very less, unequal distribution of samples according to gender and age due to which exact prevalence of nosocomial infections was not calculated for independent variables, nosocomial infections mere presence among the present study cases cannot be ruled out. Hence, further systematic and standardized large scale studies are suggested in government sectors for prevention and management of these nosocomial infections.

Conclusion

This study showed bloodstream infection and UTI are the common nosocomial infections among patients in ICU. Our study also revealed that the incidence of infections increases with the use of invasive devices and the geriatric population is highly vulnerable to nosocomial infections. Early recognition of infections and short term use of invasive devices along with proper infection control procedures can significantly decrease the incidence of nosocomial infections in geriatric patients.

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